Winter 2011

Samish rezone: environmental impact assessment

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Samish Rezone

- Environmental Impact Assessment -

Environmental Science 436
Huxley College of the Environment
Western Washington University
Winter 2011

January 28, 2011

Dear Concerned Citizens,

Enclosed is the Environmental Impact Assessment (EIA) that was compiled in accordance with the State Environmental Policy Act (SEPA, WAC 197-11) on the proposed rezoning of land around the Samish neighborhood between Interstate-5 and Samish Way in Bellingham, Washington. This report was completed as part of Western Washington University's Environmental Science Course 436 and represents a compilation of our efforts to assess and describe the natural and built environmental impacts of the proposed rezoning.

This EIA analyzes the environmental impacts to the natural and built environment for the Proposed Action, Alternative Action and No Action Alternative for rezoning the area. After examining the environmental impacts of rezoning this area of the Samish Neighborhood, we have decided that the Proposed Action is the best option for the development of this area. If the area is fully developed there will be an increase of approximately 200 homes in the area. The proposed zoning would allow for a few dense clusters to be built instead of spreading them throughout the entire area. Leaving more space untouched and in its natural state.

A formal presentation of our findings from the EIA will be held at 3 pm on March 7th at the Bellingham REI, located at 400 36th ST Bellingham, WA 98225

Sincerely,

Philip Grant Bowman _____

Ryan Nicolas Joyner _____

Kelsey Erin Lorberau _____

Alexander Joseph Riedo _____

Environmental Impact Assessment Disclaimer

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Samish Rezone

- Environmental Impact Assessment -

Winter 2011

Dr. Leo Bodensteiner
Environmental Science 436
Environmental Impact Statement
Huxley College of the Environment
Western Washington University

Authors:
Philip Grant Bowman
Ryan Nicolas Joyner
Kelsey Erin Lorberau
Alexander Joseph Riedo

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Title:

Samish Rezone

Description of Project:

The proposed action would rezone 113 acres between I5 and Samish Way from single family to multi-family in order to densely cluster newly constructed homes. This action would create approximately 245 homes, and urbanize the area.

Legal Description of Location:

Township 37
Range 3 Section 7

Proposer:

Padden Trails, LLC
220 West Champion Street, Suite 260
Bellingham WA, 98225

Lead Agency:

Whatcom County Planning and Development Services
5280 Northwest Drive
Bellingham WA 98226-9013

Permits:

City of Bellingham
Water/Sewer Permits (BMC 2-5.02)

Whatcom County
Building Permit – Residential and Detached Accessory Structures
Comprehensive Plan Amendment
Final Subdivision Approval
Preliminary Subdivision Application
Land Disturbance and Clearing Application
Water System Construction and Operation Approval
Natural Resource Notification of Activity
Notice on Title of Critical Areas & Restriction on Use or Alteration
Revocable Encroachment Permit
Road Construction Permit
Unopened and/or Unmaintained County Road Rights-of-Way Improvement Permit
Zoning Amendment Application

Federal and Washington State
Endangered Species Act (ESA) Checklist for Development within the ESA Potential Impact Area

NPDES Construction Storm water General Permit and Coverage
NPDES Sand & Gravel General Permit
Water Quality Certification
401Water Quality Certification

Author Contributions:

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Distribution List:

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Huxley Map Library
Artzen Hall 101
Western Washington University

Wilson Library
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Team Members:

Philip Grant Bowman
Kelsey Erin Lorberau
Ryan Nicolas Joyner
Alexander Joseph Riedo

Issue Date:
March 18, 2011

Public Presentation:
3pm, March 7th, 2011

Executive Summary

In late 2010 Padden Trails LLC submitted a proposal to the Bellingham City Council to rezone 113 acres of the Samish neighborhood between Interstate-5 and Samish Way. Current zoning allows for single-family residences to be spread throughout the area with large amounts of space between them. The topography of the area includes steep slopes and wetlands, making development on all of the land problematic.

Proposal:
The proposed action calls for rezoning that allows for clustering, which would create dense housing pockets and leave larger areas natural and untouched. Since much of this land is currently undeveloped now is the time to make the necessary changes to improve the area. A 220-lot subdivision was first approved back in 2005, but was never completed. One reason for this may lie with the current zoning, which only allows for single-family residences to be spread across the area.

Alternative:
The alternative action will be to continue with development of single-family houses with up to the 245 houses that the zoning will allow. This could lead to less green space in the future, depending on how the new homes are placed in this area.

No action:
The no action alternative will halt all development in the area and will not allow any new homes to be built on the 113 acres in question. This will be the most environmentally friendly proposal but will be the least socially acceptable because of Bellingham's expanding population and growing housing needs. If this is approved, urban growth will most likely be pushed further out into the county.

Impacts:
This Environmental Impact Assessment analyzes the environmental impacts from the proposed action, alternative action, and no action alternatives. The importance of this Environmental Impact Assessment is to evaluate all of the proposals and choose the best action for the area. The decision matrix allows for a visual representation for the impacts on each section.

Final Word:
At the completion of our EIA we have decided that the Proposed Action is the most acceptable option. New construction will have its consequences on the environment, but by clustering the homes into dense pockets we can limit the damage and leave more natural green space. In addition green building techniques can be used with all the new homes in the area to limit the amount of environmental damage that the area will incur over the long run.

Decision Matrix

+ Positive Impact, - Negative Impact, - - Increased Negative Impact, 0 No impact

Environmental Aspect	**Proposed Action**	**Alternative Action**	**No Action**
Natural Environment			
Earth	-	- -	0
Air	-	-	0
Water	-	- -	0
Plants	-	- -	0
Animals	-	- -	0
Energy and Natural Resources	-	-	0
Built Environment			
Environmental Health	-	-	0
Noise	- -	-	0
Housing	-	-	0
Light and Glare	-	- -	0
Recreation	-	-	0
Transportation	-	- -	0
Public Services	-	-	0
Utilities	-	- -	0

List of Figures and Tables

Glossary of Technical Terms, Acronyms and Abbreviations

Airshed: Part of the atmosphere that behaves in a coherent way with respect to the dispersion of emissions.

Assimilate: Absorb and integrate.

Biomass: Biological material from living, or recently living organisms, such as wood, waste, (hydrogen) gas, and alcohol fuels.

BOD: Biochemical oxygen demand or BOD is a chemical procedure for determining the amount of dissolved oxygen needed by aerobic biological organisms in a body of water to break down organic material present in a given water sample at certain temperature over a specific time period.

CAA: Clean Air Act

COB – City Of Bellingham

COB: City of Bellingham

DBA- Decibel Amount - is a logarithmic unit that indicates the ratio of a physical quantity (usually power or intensity) relative to a specified or implied reference level.

EPA: Environmental Protection Agency

Eutrophication - is the addition of artificial or natural substances, such as nitrates and phosphates, through fertilizers or sewage, to an aquatic system.

Greenway: A corridor of undeveloped or park land.

HHW- Household Hazardous Waste - is the term for common household chemicals and substances for which the owner no longer has a use.

Impervious: Not permitting penetration or passage; impenetrable: The coat is impervious to rain.

Infiltration: The process by which water on the ground surface enters the soil.

kWh: Kilowatt per hour.(Measurement of electricity)

LED – Light Emitting Diode – is a semiconductor light source. LEDs are used as indicator lamps in many devices, and are increasingly used for lighting.

LEED - Leadership in Energy & Environmental Design
LID – Low Impact Development

Loam: A rich, friable soil containing a relatively equal mixture of sand and silt and a somewhat smaller proportion of clay.

Micron: A metric unit of length equal to one millionth of a meter.

NAAQS: National Ambient Air Quality Standards

Natural Buffers: Protected areas adjacent to streams and other water bodies that are left in a natural vegetated state. They aid in reducing water pollution from adjacent land uses.

Nonpoint Source: Water pollution affecting a water body from diffuse sources, such as polluted runoff from agricultural areas draining into a river, or wind-borne debris blowing out to sea.

NWCAA: North West Clean Air Act

PCB- Polychlorinated Biphenyls - are a class of organic compounds with 1 to 10 chlorine atoms attached to biphenyl, which is a molecule composed of two benzene rings.

Permeability: A measure of the ability of a material (such as rocks) to transmit fluids.

Petroleum: Naturally occurring, flammable liquid consisting of a complex mixture of hydrocarbons of various molecular weights and other liquid organic compounds, that are found in geologic formations beneath the Earth's surface.

SR11 – State Route 11, Chuckanut Drive

Stationary Source: A source that emits more than a certain amount of a pollutant as defined by the U.S. Environmental Protection Agency (EPA). The amount of pollutants allowed for certain new sources is defined by the EPA's New Source Performance Standards (NSPS).

Swale: Low tract of land, especially one that is moist or marshy.

Toxicant: A chemical compound that has an effect on organisms.

Turbidity: The cloudiness or haziness of a fluid caused by individual particles (suspended solids) that are generally invisible to the naked eye.

WA DOE: Washington Department of Energy/Department of Ecology

Wetlands: An area of land whose soil is saturated with moisture either permanently or seasonally.

WTA – Whatcom Transit Authority

Project Objectives

Site Description

This site is about 113 acres in the Samish Neighborhood of Bellingham, Washington. It is east of Interstate-5 and west of Lake Padden Park and Padden Creek. There are extremely steep slopes, including the Padden Creek channel to the north. No sewer or water serves the area.

Proposed Action - Clustered Rezone

The Growth Management Act only allows changes to the Bellingham Comprehensive Plan once a year. The “Clusered Rezone” that this report focuses on, is one proposal that was submitted to be reviewed by the city.

The plan involves a request to change the land use designation and zoning from Single Family Residential, Low Density to Multifamily Residential, Medium Density. This will decrease spacing allowed from 20,000 square feet to 6, 250 square feet per dwelling unit. This will allow housing to be closer together (clustered) to make more efficient use of the land and avoiding the wetlands, steep slopes and rock outcroppings.

Alternative Action – Single Family Residential

The alternative action is a full build-out of the land, under the current zoning. Presently, 245 lots are allowed, but the Padden Creek gorge, wetlands, and steep slopes limit the amount that could actually be developed. In this plan, 64 acres were to be left as open space. This land provides view, access, and natural buffers between the development and Lake Padden Park.

Because of the need to work around environmentally sensitive areas and the unique layout of the plot, it has not currently been developed and none is planned with this zoning. For the purposes of this report, we will assume that this alternative involves the land-owners constructing the maximum amount of houses possible under the law.

Section 1. Natural Environment

1.1 Earth……..

Existing Condition

Extremely steep slopes, 30 to 60 percent grade (COB, 2011) distinguish these 113 acres. Small lots have been designated, but are undevelopable because of the terrain. It is difficult to access and not currently set up for sewer or water. Lake Padden, the Padden Creek Gorge and Interstate 5 bound the plot; it is isolated from existing neighborhoods. The cliffs, ravines and steep slopes raise concerns about slope stability and erosion. The soils are types of loam found in hillslopes (COB, 2011).

Proposed Action

Impacts

The increase of impervious surfaces due to development and urbanization may cause a three to tenfold increase in surface run-off (COB: Planning, 2011). Development increases the amount of impervious surfaces which increase runoff rates and volumes into surrounding waters and increases the amount of soil moved due to water flow. Drainage, erosion and runoff are associated with infill and new building..

Mitigation

The amount of adjoining open space that could be conserved and used by the area's residents can be achieved by cluster development if wisely directed. The water runoff and drainage problems should be handled at the source, rather than downstream, by retaining natural drainage ways, preserving as much of the natural vegetation as possible and reducing impervious surfaces by clustering and urban design. There should be natural buffers of land to lessen the effects of the developed areas. In addition, development must work around the ridges and slopes to avoid erosion and degradation of the unstable land. Altering hills can lead to increased erosion, landslides and sedimentation and septic systems may be unreliable. In addition, maintenance of infrastructure is expensive and difficult (IN DOT, 2010). Tree planting and replacement, as part of development, should be done to preserve sensitive areas and unique geographic formations and connect them with a system of greenway corridors. Disturbance of existing permeable soils should be minimized so that new development has less of the downslope effects caused by uphill development.

Alternative

Impacts

The current plan includes 37 acres of environmentally sensitive land including ridge, watershed and trail areas to be added to Lake Padden Park. It includes trail connectors into the park from the project area containing elevated water and territorial views. The current zoning does not allow flexibility in site design to work around the steep slopes. Development increases the amount of impervious surfaces which increase runoff rates and volumes into surrounding waters and increases the amount of soil moved due to water flow. Drainage, erosion and runoff are associated with infill and new building. Because it is not possible to cluster development with this plan, the impervious surfaces which are spread out will cause an increase in water runoff and drainage, affecting the flow and rates and erosion and siltation into the surrounding watersheds.

Mitigation

To develop with the current zoning, there must be natural buffers for Interstate 5 and Lake Padden Park including the previously determined area to be gifted to the Park. In addition, development must work around the ridges and slopes to avoid erosion and degradation of the unstable land. Tree planting and replacement, as part of development, should be done to preserve sensitive areas and unique geographic formations and connect them with a system of greenway corridors. Disturbance of existing permeable soils should be minimized so that new development has less of the downslope effects caused by uphill development.

No Action

The earth and landscape will be preserved and there will be no negative impacts on the soils with this alternative.

1.2 Air

Existing Condition

The Samish Neighborhood is located in the Fraser River airshed which encompasses the greater Vancouver, B.C. Area (Government of BC, 2008). When determining if an area meets the federal air quality standards, the Environmental Protection Agency (EPA) designates the area as attainment, nonattainment or unclassifiable (not enough information to designate) based on a state's recommendation.

The site currently has attainment status meaning that existing ambient air quality in the Bellingham area meets Washington State and National Ambient Primary and Secondary Standards for all seven. Those pollutants are Carbon Monoxide, Nitrogen Dioxide, Lead, Particulate Matter, Ozone, and Sulfur Dioxide. (EPA, 2010)

The site is regulated under the Northwest Clean Air Agency (NWCAA), Washington State Department of Ecology (WA DOE), and the Federal EPA. Particulate matter is currently monitored in Bellingham at the Yew Street Center station, located on the corner of Yew Street and Alabama Street. Air quality measurements made at the Yew Street Center are well below the State and Federal standards listed.

Air quality data are not available in the immediate vicinity of the site. The area of the proposed rezoning is adjacent to Interstate 5. Particles less than 10 microns (PM10) can be traced to dust from roadways. Other toxicants of concern which result from automobile emissions include ozone, carbon monoxide, nitrogen oxides, sulfur oxides, and greenhouse gases.

Proposed Action

Impacts

Throughout the development process, the construction of houses and roads will reduce air quality. Construction of approximately 200 single family units will cause increases in air pollution through generation of dust from grading, heavy machinery emissions, demolition work, sand blasting, spray painting, and burning of debris. The heavy machinery requires diesel to run and the Department of Ecology has identified diesel exhaust as the air pollutant most harmful to public health in Washington State. Bare solids will also be exposed during the construction process. Overall, there will be an increase in the amount of air pollution during the construction phase, but it will not be permanent. The construction of homes will occur at the same time over a three to four month period of time.

Following development, automobiles will be the primary source of air pollution. The four main pollutants emitted by motor vehicles are carbon monoxide, particulates, nitrogen oxides, and sulfur oxides. An increase in ambient concentrations of carbon monoxide and particulate matter can lead to increased levels of cancer, asthma, and other respiratory ailments. Air pollutant emissions will also increase from stationary sources constructed in the area. Stationary source emissions will mainly consist of particulate matter, sulfur dioxide, and nitrogen oxides. The primary source of air pollution from

stationary sources will come from devices used to heat homes such as wood burning stoves, furnaces, and gas fireplaces.

Mitigation

During the construction phase, keeping open areas properly covered when not in use will decrease the concentrations of particulate matter in the area. These dust suppressing techniques are composed of things such as plastic sheeting, watering dry dirt roads, and suspending work during windy or extremely dry periods.

To lower automobile emissions the city could provide incentives for citizens to adopt alternative travel modes. These incentives include providing sufficient public transportation infrastructure, improving the walkability of the city with sidewalks, and adding bike lanes. To reduce the pollution emitted by wood burning, regulatory measures and voluntary bans on residential burning can be set. The NWCAA requires that only dry, clean, untreated wood or manufactured logs can be burned. Additionally, wood stoves must meet Washington State air emission standards, and be certified by the EPA as a clean burning wood stove. The availability of clean natural gas and electricity in this region also allows for the substitution of wood burning stoves.

Alternative

Impacts

During the construction phase, the development of a non-clustered community will have more exposed dirt than a clustered one. These will lead to more severe impacts during the construction phase.

The amount of air pollution associated with vehicle emission and wood burning stoves will remain the same due to the population of the neighborhood not changing with the proposed rezone.

Mitigation

Same as proposed action.

No Action

This alternative will not degrade air quality in the proposed area; however, development will occur in other areas throughout the county and city to accommodate projected population growth. Depending on the placement of this development, this may create air quality concerns for other areas of Whatcom County and the City of Bellingham.

1.3 Water

Existing Condition

The site is a part of the Padden Watershed and the Chuckanut Watershed. The division runs through the center of the site. (See Watershed Map)

The Upper Padden Watershed flows into Lake Padden. Water from Lake Padden empties into Padden Creek then flows through the Padden Creek Sub-Basin of the Bellingham Bay Watershed. The proposed neighborhood development will affect Lake Padden as well as any other bodies of water downstream from Lake Padden. When measuring the environmental impact of the proposed development it is most appropriate to look at the lake, the body of water closest to the development furthest upstream.

Lake Padden is a 150- acre lake situated within Bellingham city limits that serves a variety of recreational purposes including fishing, swimming and boating. Currently it has category 5 water designation, which means that at least one characteristic or designated uses are impaired (Department of Ecology, 2011). The primary sources of pollutants come from nonpoint sources such as chemicals used in lawn and garden maintenance as well as automobile-related oils and heavy metals. The pollutants enter the lake via storm runoff. Lake Padden is currently listed on the Washington State Department of Ecology (WA DOE) 303(d) list of impaired bodies of water for Polychlorinated Biphenyls (PCBs). A regulatory ban of PCBs was put into place in 1970s but these chemicals do not readily break down in the environment causing them to remain for long periods of time. PCBs cause cancer and other adverse health effects on the immune, reproductive, nervous, and endocrine systems in both humans and aquatic species.

The Chuckanut Watershed is 889.92 acres and is considered to be the most intact watershed in Bellingham. The creek is fed by tributaries flowing from Chuckanut Mountain to the south and Lookout Mountain to the north. The forested areas of the upstream zones ensure high water quality through a system of natural filtration. The lower portion of the watershed lies within the city boundary and is considered to have the greatest number of species and biodiversity for the respective habitats within city limits. A unique aspect of this watershed is that its shoreline is the last forested shoreline in the city. The overall condition of this watershed is very healthy.

Proposed Action

Impacts

The proposed action will have the following effects on the upper Lake Padden: lower dissolved oxygen levels, increased sedimentation, turbidity, erosion, and contaminants entering the stream.

The urban development will increase the amount of impervious surface throughout the site. The majority of impermeable surfaces will come from roads and rooftops, but other types include sidewalks, and patios. Impervious surfaces are materials that prevent the infiltration of water into the soil. The soil would otherwise act as a filter to the water before it enters into groundwater and streams.

Heavy rains along with a large cover of impervious surfaces can degrade the health of streams and wetlands by increasing sediment, nutrients and other contaminant loads beyond the capacity to assimilate them. Construction sites are primary sources of these pollutants, and once carried to the stream, the pollutants increase the turbidity of the water. Turbidity is a measure of the cloudiness of a fluid due to suspended solids. High turbidity levels can reduce the amount of light reaching lower depths, which can inhibit growth of submerged aquatic plants and consequently affect species, such as fish and shellfish. High turbidity levels can also affect the ability of fish gills to absorb dissolved oxygen. (Benfield, 2007)

Increased nutrient levels from the lack of filtration will cause in increase in algal growth. High levels of algae will add to the lack of light due to turbidity and may decrease the amount of dissolved oxygen in the water due to an increase in the biological oxygen demand. This can lead to an adverse effect on aquatic species that require certain dissolved oxygen levels to live and function in a healthy manner. Erosion is also likely to occur in the area due to a change in the hydrology. During periods of heavy rainfall, the impervious surfaces are likely to increase the velocity of storm runoff and cut new channels through the natural environment. When soil is stripped away, the velocity of the storm runoff may increase, creating a positive feedback loop.

Mitigation

A retention pond installed in the area would retain a resident pool of standing water, which would improve water quality treatment between storms. A retention pond is a type of best management practice (BMP) that is used to manage stormwater runoff to prevent flooding and downstream erosion, and improve water quality in an adjacent river, stream, lake or bay (EPA, 2011).

The use of pervious concrete pavement would reduce the amount of impervious surfaces in the development by capturing stormwater and allowing it to seep into the ground. Porus concrete is instrumental in recharging groundwater, reducing stormwater runoff, and meeting Federal EPA stormwater regulations. The use of pervious concrete is amongst the Best Management Practices (BMPs) recommended by the EPA for the management of stormwater runoff on a regional and local basis. (EPA, 2011) This pavement technology creates more efficient land use by eliminating the need for retention ponds, swales, and other stormwater management devices.

Alternative

Impacts

A full build out of single-family residences would contain more impervious surface area than clustered development, this is due to the fact that the community would be more spread out and require more roads. The houses themselves would also be larger meaning that the total amount of rooftop surface area would be greater. While the alternative would have the same impacts on the Padden Creek Watershed, the severity of those impacts would be greater. There would be higher volumes of runoff due to the increase in impervious surface area. This would cause more erosion and transportation of pollutants to nearby streams.

Mitigation

Besides the concentration of housing, the mitigation strategies of the proposed action and the alternative action are identical. Concentrated housing developments can also contribute to a decrease in impervious services. Fewer roads are required in clustered neighborhood developments.

No Action

This alternative will not degrade water quality in the proposed area; however, development will occur in other areas throughout the county and city to accommodate projected population growth. Depending on the placement of this development, this may create water quality concerns for other areas of Whatcom County and the City of Bellingham.

1.4 Plants

Existing Condition

This site is currently undeveloped and so is fully vegetated and contains several wetlands. There are no records of delineated wetlands by the National Wetlands Inventory (NWI) (US FWS, 2010), but the City of Bellingham identifies 6 wetland pockets from the City Wetlands Inventory from 1992, a reconnaissance survey by a local team of wetlands specialists (COB Maps, 2010). They represent an effort of display higher precision than the NWI but do not contain designations. In addition there are areas in our site designated as 60% wetland and areas that are upland with Wetland Pockets from the City wtland Inventory from 2003, conducted by the Northwest Ecological Services, LLC (COP Maps, 2010). Wetlands are natural reservoirs for precipitation, increase groundwater recharge and help reduce soil erosion and surface runoff.

The plot is part of the western hemlock vegetation zone (COB Parks, 2010), adapted to our mild and wet climate. Much of it is covered with mature conifer forest and the location also forms an important linkage with the protected land of Lake Padden. The trees include western hemlock, Douglas fir, and western red cedar.

The mid-elevation wetlands found on our site are one of the 87 known high-quality or rare plant communities of Washington State in Whatcom County (WNHP, 2011). Wetlands support a great number of different species and are very productive. These forested wetlands are not usually flooded, but have saturated soils. Black cottonwood, red alder, and western red cedar with a lower level of vine maple, cascara, salmonberry, and devil's club can be found here (COB Parks, 2010).

In addition, this site includes the riparian areas around Padden Creek. Riparian corridors are important boundaries between terrestrial and freshwater habitat. A change in plant composition, relative plant abundance and soil moisture content define these edges.

Proposed Action

Impacts

Development will result in removal and disruption of current vegetation to make room for roads, buildings and other infrastructure. The sensitive wetland habitats will be disrupted or destroyed.

Mitigation

There should be no development on wetland areas, to preserve the habitat and vegetation and for the significant ecosystem services that they provide. Buffers should be constructed between developed and natural areas, and care should be taken that rare plants are not destroyed. Buffers above steep slopes, and along wetlands would preserve the important, sensitive habitat in these areas.

Alternative

Impacts

The alternative action will also result in disruption and removal of vegetation. Because of the wetlands and ridge areas, it will be difficult to access the areas for construction under this option. As a result, more of the landscape and vegetation will be destroyed. Because the development under this plan will be spread out, the construction and effects of urbanization will impact more areas, and may have potentially more negative effects.

Mitigation

There should be no development on wetland areas, to preserve the habitat and vegetation and for the significant ecosystem services that they provide. Buffers should be constructed between developed and natural areas, and care should be taken that rare plants are not destroyed. Buffers at least 100 feet wide along streams, above steep slopes, and along wetlands would preserve the important, sensitive habitat in these areas.

No Action

The habitat and plants that are present would be preserved and continue to live as they are now, if there is no development.

1.5 Animals

Existing Condition

The Chuckanut Watershed (which runs through our site) is the most intact in Bellingham and the wildlife community represents nearly all of the species and habitats found within the city, besides large fresh-water lakes and fallow field habitats. It has extensive forests uplands, small cliffs, caves, snags, riparian areas, salmon and trout-bearing streams, complex wetlands, marine shoreline, estuary and marine embayment It has great habitat diversity with connectivity and important linkages with protected land. Adjoining mature conifer forests dominate the landscape. The Chuckanut Watershed holds the largest known vertebrate species diversity in Bellingham; the animals are adapted to and depend on the habitats found here. The open, grassy freeway median and edge of I-5 support a limited prey base for some raptors and provide road-kill for scavengers. The freeway corridor, however, poses a barrier and hazard to wildlife, due to lack of cover and fast-moving traffic.

Chuckanut Creek provides the highest quality fish habitat and the greatest diversity of native, naturally reproducing fish in the City, due to minimal development in the watershed. Native, naturally-reproducing cutthroat trout and steelhead spawn, rear, and migrate in Chuckanut creek (COB Parks, 2011) along with coho and chum salmon, whose populations have been enhanced by hatchery stock.

The Padden Watershed contains the largest protected contiguous open space in the City and harbors notable species richness, habitat diversity and species of concern, second only to Chuckanut in known species abundance (COB Parks, *by Watershed*, 2011). The connection to Chuckanut in the south (the area here proposed for development) is one of the few areas that remain unprotected. The watershed is home to a great diversity of bird species, fish in the lake and creeks, and small and large mammals, including several priority species and species of concern and sensitive and rare species of amphibians.

The Washington State species of concern that live in this area include the bald eagle, the peregrine falcon, merlin, blue heron, and pileated woodpecker. Purple martin, Vaux's swift and western bluebirds also warrant special concern. They can be found near urbanized areas, but need a large amount of undisturbed vegetated habitat to live. Many bird species common to upland forests and stream valleys can tolerate nearby development as long as they have some habitat and connecting migration corridors. Migratory songbirds, however, do not easily become accustomed to fragmented forest habitat. Also, this area is located in the Pacific Flyway, a north-south migrating route for waterfowl.

The forest in this site is home to many large and small mammals, reptiles, and amphibians. Species include the Douglas squirrel, introduced grey squirrel, introduced cottontail rabbit, introduced opossum, skunk and raccoon as well as the black-tailed deer and coyotes (COB Parks, *by Watershed*, 2011).

Padden Creek flows through the site and is surrounded by an undisturbed riparian corridor. Riparian corridors are important sources of wildlife biodiversity and as migration routes for

many species, because of their transport of water, plants and nutrients (COB Parks, 2011). Riparian and wetland vegetation provide food and habitat and are generally substantially more important than upland forested areas for habitat. Riparian vegetation enhances fish spawning conditions by providing shade, bank stabilization, insect breeding ground, and organic material for the stream. Like riparian spaces, wetlands support many species: the adjacent wooded areas are critical to wetland-dependent species on this site such as waterfowl, or small mammals like beaver, for nesting, forage and cover.

Proposed Action

Impacts

Stormwater runoff from development and the increase of impermeable surfaces will potentially impact fish and wildlife. It could modify the frequency and duration of wetland inundation, affecting the stability of existing wildlife communities, increase erosion and sedimentation, increase pollutants in the water column, increase high flow events and flooding, and displace existing communities of plants and animals.

Mitigation

Protection of habitat linkages, and formation of a functional network of reserves and corridors is recommended to preserve habitat and species diversity. The existing forest/wetland corridor linking the Lake Padden area with the Chuckanut Watershed is a priority area for protection (COB Planning, 2011). To protect fish and other aquatic species, stormwater runoff should be diverted into detention areas for biofiltration instead of being discharged into streams. Buffers at least 100 feet wide along streams, above steep slopes, and along wetlands would provide corridors for species to colonize new areas, forage for food, find mates, and exchange genes with neighboring populations. Buffers this wide have been found to be successful for wildlife migratory corridors (COB Parks, 2011). The cluster design of this plan means that urban areas can be clumped together strategically to preserve habitat for wildlife.

Alternative

Impacts

The alternative action would result in more initial disruption, but less impact from surface runoff because of the amount of imperious surfaces.

Mitigation

Construction of infrastructure and residential lots would have to be undertaken keeping in mind the importance of habitat linkages and sensitive areas, such as wetlands, avoiding those areas to make sure there are minimal lasting impacts. Buffers at least 100 feet wide along streams, above steep slopes, and along wetlands would provide corridors for species to colonize new areas, forage for food, find mates, and exchange genes with neighboring populations.

No Action

The habitat and wildlife that are present would be preserved and continue to live as they are now unless surrounding development has an effect on the area

1.6 Energy and Natural Resources.....

Existing Condition

The majority of the area is forestland with a few social trails running through the site due to its proximity to Lake Padden and the adjacent Samish Neighborhood development. There are also wetlands on the site, which provide ecosystem services such as water storage, sediment trapping and nutrient cycling (Tharme). There is currently no development or infrastructure on the land, meaning that there is no demand for natural resources and energy. If the site were to be developed, the provider of electricity would be Puget Sound Energy and the provider of natural gas would be Cascade Natural Gas.

Proposed Action

Impacts

The wetlands are protected from being developed, which means that their ecosystem services will still be provided. As discussed in the air section of this EIA, devices to heat homes such as wood burning stoves will pollute the region and can be considered a source of energy.

The significant impacts of the proposed action with respect to energy are the creation of a demand for both electricity and natural gas. PSE obtains its electricity from the following sources: 42 percent hydro, 37 percent coal, 19 percent natural gas, 1 percent nuclear, and 1 percent other (biomass, landfill gas, petroleum, solar, waste, and wind) (PSE, 2011).

The generation of electricity from large power providers such as PSE generally has a negative effect on the environment. The burning of coal to generate electricity can cause acid rain through the release of sulfur into the atmosphere. The sulfur in the atmosphere lowers the pH of rainwater causing acid rain. While some types of coal burn cleaner than others, there is no such thing as a truly clean coal (one that emits no sulfur when burned). The average home used 920 kWh a month in 2008 (DOE, 2008). According to these figures the proposed 245 home community would use about 225400 kWh of electricity each month.

Natural gas, though it is the cleanest of all the fossil fuels, still has an adverse effect on the environment. Composed primarily of methane, the main products of the combustion of natural gas are carbon dioxide and water vapor. Coal and oil are composed of much more complex molecules, with a higher carbon ratio and higher nitrogen and sulfur contents. The problem with all fossil fuels, however, is that they release large amounts of carbon dioxide. This is the leading cause of global warming.

Fossil Fuel Emission Levels - Pounds per Billion Btu of Energy Input			
Pollutant	Natural Gas	Oil	Coal
Carbon Dioxide	117,000	164,000	208,000
Carbon Monoxide	40	33	208
Nitrogen Oxides	92	448	457
Sulfur Dioxide	1	1,122	2,591
Particulates	7	84	2,744
Mercury	0	0.007	0.016

Source: EIA - Natural Gas Issues and Trends 1998

Mitigation

In order to reduce the demand for electricity, energy efficient technologies can be adopted in the development. Lighting fixtures, for example, have many energy efficient alternatives such as compact fluorescent lights (CFLS) and light emitting diodes (LEDS). The average LED light only uses 40% of the electricity of an incandescent bulb while emitting the same amount of lumens (a unit that measures light). After the construction phase, if PSE gives residences an incentive to adopt energy efficient appliances such as refrigerators and dishwashers this can further reduce the electric demand.

In order to reduce the demand for natural gas, technologies such as high performance windows and more effective insulation should be adopted. These technologies prevent heat from escaping one's home.

Alternative

Impacts

The impact on the electric and natural gas demands will be identical under the Alternative Action as described in the Proposed Action.

Mitigation

Same as proposed action.

No Action

The no action alternative will not increase the demand for electricity/natural gas in the proposed area.

Section 2. Built Environment

2.1 Environmental Health……..

Existing Condition

Physical changes are often required to develop a natural space into a residential area. The processes, that most residential and developing/developed areas undergo to sustain modern human environments, usually involve some form of physical change to the natural world. This physical change is often done through the use of herbicides, pesticides, asphalt, and sediment stabilizers (US EPA, 2010). Once the land is developed for residential living, chemicals such as cleansers, oil, fecal matter from pets/livestock, and fertilizers may also be present. These are referred to as Household Hazardous Waste (HHW). Usually these substances are stored and used safely, but using improper disposal and handling methods of these chemicals can lead to contamination of waterways, native soil, and vegetation. Bioaccumulation of these materials along with immediate exposure to pollution can both be linked to poor environmental health (US EPA, 2010).

Although this particular development is not directly bordering the Lake Padden body of water, the lake is less than a mile from the area. The residents of the rezoned area would be able to use the Lake Padden Park and trails along with the waterway available for recreation as well as fishing. The lake has been found to contain polychlorinated biphenyls (PCBs) chemicals known to cause conditions such as reproductive, endocrine and nervous system malfunction (US EPA 2010). It can also cause cancer and other health issues after prolonged exposure (US EPA 2010).

Increased levels of nitrogen and phosphorous from runoff into the lake from surrounding residential property has led to the eutrophication of the water body. This ecological process lowers dissolved oxygen levels below what is habitable by aquatic life, which degrades the species density and richness. Decreased biodiversity and speciation of the lake contributes to overall habitat loss and malfunction (US EPA).

Because the proposed re-zone is to a higher density housing project, the increased natural gas pipeline and fire mitigation measures pose threats to surrounding land. Natural gas exposure to groundwater can cause ecological poisoning of the surrounding habitat.

Proposed Action

Impacts

The proposed re-zone of the area will bring a higher density population of people which may also bring a higher exposure rate of hazardous materials to the surrounding environment directly surrounding the proposal. The Lake Padden watershed will see an increase in hazardous household waste products through runoff from fertilized yards and driveways into storm drains. Along with the increase in hazardous chemicals will be an increase in the concentrations of the eutrophication-causing nitrogen and phosphorous.

Development on smaller, but more concentrated area will localize the spread of waste and chemical exposure. Conversely the damage and exposure is likely to be more severe and extensive if the development is spread out more.

Energy demands propose major issues for new development, as pipeline and waste water transport must also be constructed. Their simple presence attributes to higher risk of exposure to fire and leakage events, both of which lead to environmental degradation.

Mitigation

The procedures for proper handling of individual chemicals must be followed to avoid unacceptable levels of environmental exposure. The Division of Emergency Management, as well as the Local Emergency Planning Committee, insist on the reporting of any use of hazardous chemicals or actions, so that the proper response to potential environmental and planning issues may occur.

The Pipeline Safety Ordinance of 2010 is a measure that outlines that would lead to increased notices as well as accelerated timelines of response (JE Ryan, 2011).

Alternative

Impacts

Because more dense concentrations of people will lead to a greater amount of land left undeveloped, it is likely that the greater density of the proposed action will not pose any more of a hazardous impact to the built environment than that of the lower density of the alternative. Because the energy sources and waste water pipelines will be going to more destinations, in a lower volume, different risks of exposure occurs spread over increased land surface area.

Mitigation

The procedures for proper handling of individual chemicals must be followed to avoid unacceptable levels of environmental exposure. The Division of Emergency Management, as well as the Local Emergency Planning Committee, insist on the reporting of any use of hazardous chemicals or actions, so that the proper response to potential environmental and planning issues may occur.

The Pipeline Safety Ordinance of 2010 is a measure that outlines that would lead to increased notices as well as accelerated timelines of response.

No Action

Under the no action alternative, the built environment in the short term will see no significant increase in risk to environmental exposure. But because urban growth and the expansion of Bellingham is expected to increase, it is likely that eventual exposure to such development practices will occur.

2.2 Noise

Existing Condition

Currently, the rezoned area is under light development with a few primitive access roads. No construction has begun and the surrounding environment has had little significant prolonged impact due to noise. Because there is an absence of human activity, noise pollution is fairly low.

Proposed Action

Impacts

Chapter 173-60 WAC puts a limit of 55 DBA (the measurement of noise frequency and intensity) at any given time within a residentially zone area (Whatcom County 2010). The same laws that allow officers to breakup large gatherings may also apply to the increased levels of human populations. Because the presence of any noise above 55 DBA is considered noise pollution, its presence is likely to increase due to development of human urban areas (Whatcom County 2010).

Construction will cause increased noise pollution to surrounding areas. The Noise Control Act of 1972 disallows loud noise between 10pm and 7am, which may not necessarily effect, but will certainly be limit construction by acceptable noise pollution.

With an increased number of vehicles, noise from tires, engines, and other motor-vehicle processes will be factors leading to increased pollution. While exhaust pipes and sound dampening materials are used to decrease the sound from cars, 80 DBA are emitted from vehicles, on average, making their presence a polluting factor. Trees, shrubs and buildings will all insulate some sound, but high traffic periods will be inevitable, leading to peak periods of noise pollution (Whatcom County, 2010).

Construction within short time periods will cause increased noise pollution to surrounding areas. The Noise Control Act of 1972 disallows loud noise between 10pm and 7am, which may not necessarily effect, but will certainly be limit construction by acceptable noise pollution. During the hours of operation, construction can be expected to produce sounds in excess of 100 DBA for short periods of time (Whatcom County, 2010).

Alternative

Impacts

Because there are no current areas of construction, any form of new development will cause more noise than is presently there. The noise created by the construction of higher density structures may be increased if only for the greater length of construction for larger structures. The noise would be more localized, and potentially insulated, from surrounding areas by larger greenbelts of both trees and shrubs.

No Action

A no-action plan will likely increase noise levels eventually by virtue of eventual growth in surrounding areas.

2.3 Housing

Existing Condition

The area is currently vacant of any housing pending the rezone to smaller, but more densely populated lot sizes. Few primitive roads have been put in primarily for construction access, but no permanent structures have been added. There are pre-existing homes with what appears to be some land on the periphery of the proposed rezone area, but not much is known about their current status or habitation. The areas surrounding the re-zone do have some houses dispersed intermittently, with most land remaining un-developed, giving the area a remote feel.

Proposed Action

Impacts

With higher density building, larger, more elevated structures than the average single family home are likely to be put in place. Additionally, parking and parking structures for vehicles will also likely be built. This would be significantly different than the current development of the surrounding area, and would be noticeable. Housing prices and rent can be expected to be initially higher than some parts of Bellingham due to relative newness of potential structures, making them potentially un-affordable for students.

Mitigation

Keeping the higher density housing lower and potentially capping their height at three to four levels will allow for some high density living, while not drastically altering the look of the landscape. Parking structures and paved parking lots can be constructed either underground, or underneath a raised structure, which will reduce the footprint of developed impervious land.

Alternative

Impacts

Single family lower density houses would cover more land, leading to more impervious surfaces as well as low height (one to two stories) homes. The amount of impervious surfaces will increase from high density housing due to more roads and driveway construction. Additionally less individual vehicles will be present, making the need for parking structures and parking lots not necessary. More of the pre-existing natural landscape will be altered as well, calling for the removal of more trees and flattening of land for the bases of houses.

Mitigation

Lower density housing by way of single family homes, spread out across the land will lead to much smaller green patches. These can be increased by spacing houses so that back yards can face each other, and passing housing ordinances banning fences. Just like with the higher density builds, houses can also be kept low in height (one to two stories).

No Action

Because the area is currently undeveloped, a no-action plan would have no adverse impacts, letting the area develop according to Bellingham's growth on some future date.

2.4 Light and Glare.....

Existing Condition

Light and glare comes from house lights and streetlights. The area between I5 and Samish Way has only been partially developed at this time, so light and glare do not affect the area in a significant way. Current zoning mandates the new houses will be spaced out in such a way that light between them is inconsequential. In addition, the current zoning will allow for enough land surrounding any new houses that there will not be any light pollution onto public land.

Proposed Action

Impacts

The proposed action calls for an increase in clustered development, meaning more houses in a smaller area. This would create more intense areas of light and glare not only when the houses are completed and also during construction. During construction there will be possible light sources from nighttime security. Possible sources of glare would include plastic sheeting used to cover building materials that are waiting to be used, vehicle windshields and also glare from the windows installed in the newly constructed homes.

Mitigation

Reducing the amount and the intensity of the light and glare is feasible. Streetlights could be fitted with shielding systems, which would aim the light downward and reduce the surrounding amounts of glow. Another option would be LED streetlights, which would reduce the amount of glare and also save energy. LED lights consume less then half the power of conventional lights and also can last up to five times longer. Construction materials could be covered with non-reflective tarps that would reduce the amount of overall glare in the morning and evening hours. Construction could also be limited to daytime hours, which would not only reduce the amount of light in the area during the nighttime, it would also reduce the number of vehicles coming and going.

Alternative

Impacts

The alternative action allows for the same amount of residences but in a more spread out area. This would decrease the amount of light seen between the homes since they would be separated by greater distances, but overall would have some of the same impacts such as increased light and glare. This would also increase the impact upon wildlife since development would be spread out, increasing the proximity of residences to an undisturbed area.

Mitigation

Mitigation would be similar to the proposed action, but on a smaller scale throughout the area since there would be single family homes constructed. Construction would be spread out overtime throughout the area allowing for less intense light pollution at a given time.

No Action

This alternative would leave the area between I5 and Samish Way natural. The area would be free of light pollution, and wildlife would be unaffected by humans' sources of light. This would also reduce the amount of motor vehicle traffic in the area, further reducing the amount of light and glare present at night.

2.5 Recreation……..

Existing Condition

Currently there are no public parks or trails in the 113 acres located between I5 and Samish Way. There are recreation areas close to the area that will see an increased amount of traffic if new homes are built. Lake Padden Park is the closest park, located just over a mile to the east of the proposed development that provides opportunities and facilities for running, hiking, softball, tennis, boating, swimming, fishing, and a playground. Powerboats are currently not allowed on the lake. The lake and its facilities are most actively used in the late spring and summer months. Just east of Lake Padden is the Lake Padden Golf Course and Country Club, which is a public 18-hole course.

Proposed Action

Impacts

Currently no parks or trails exist in the area that is proposed for new development. Adding clusters of homes would not have any negative impacts upon the area. If approved, the new zoning regulations would allow homes in a smaller area, with the sensitive areas such as steep slopes and wetlands left untouched. This would leave undeveloped areas open to public use if trail systems or parks were put in place. Before any new trails could be built in the area an assessment would be required to determine if the area is suitable. The increased amount of homes and residents in the area could also put a strain on the current parks and trail systems that are nearby, such as Galbraith Mountain or Lake Padden Park.

Mitigation

In order to mitigate the increased amount of traffic at the parks and recreation areas near the proposed development and reduce wear and tear to existing facilities, The City of Bellingham should update the goals and policies of the Recreation Chapter of the County Comprehensive plan. Because of the clustering of new homes, it would be possible to add a series of trails or hiking paths to the area to reduce traffic on already existing facilities.

Alternative

Impacts

The alternative action plan would develop a larger area, with houses spread out across the area with large spaces between them. The nearby recreation areas would see an increase in use from the new residents in the area. This option also will not allow any natural habitat to be used for new trails or park systems.

Mitigation

Mitigation would be the same as the proposed action since the same number of new homes will be constructed.

No Action

The no action alternative would leave the area the same as it currently is. No new houses would be constructed and there wouldn't need to be any new trails or parks constructed in the area.

2.6 Transportation

Existing Condition

The main arterial serving this area is Samish Way, and any new development would connect to it. There are multiple points for the new development to be connected to Samish Way between 34th and 40th street. These streets stop at the end of the current development in the area. If extended they could serve the new clusters of homes. In addition there are two public transit bus lines operated by the Whatcom Transit Authority currently serving the area between Samish Way and I5. These bus lines operate only on Samish Way and Yew Street. In addition the bus lines operate only about once an hour during the week from the hours of 6 am until 7 pm and from 9 am until 6 pm on weekends. The closest train and bus terminal for service out of the city is located approximately 2.5 miles south along SR11 from the proposed site development.

Proposed Action

Impacts

The proposed action would add dense clusters of homes to the area between I5 and Samish Way, so extending roads in the area could provide access. This would put additional traffic on Samish Way since it is the main arterial in the area. In addition this would add new riders to the bus lines that are currently in place. The collector roads in the neighborhoods in the area would become significantly more crowded if new roads were not introduced to handle the increased amount of development.

Mitigation

Any new development is prohibited within the COB unless improvements are made to the mutli-modal transportation system. This would include bike routes, walking paths, and public transportation. A quicker and more direct route to I5 would be advisable to reduce the amount of traffic on Samish Way. The closest on ramp is at exit 250, the Historic Fairhaven District and SR11. If 34th street were extended directly south it would intersect with the new area of development and provide a direct route in and out of the area. In order to reduce the amount of cars on the streets WTA could add more bus lines or incorporate the new development into the bus line already in the area.

Alternative

Impacts

Creating any new homes will add more traffic to the system. The alternative action would allow for a few hundred more houses to be spread across the development site. Current roads in the area will also see increased traffic first during the construction phase and then the homes are completed.

Mitigation

Mitigation will be similar to that for the proposed development. Improvements to public transportation and increased bike lanes could reduce the number of vehicles on the roads.

No Action

The no action alternative would leave the area undeveloped as it currently is. This would not put any additional strain on current roads in the area.

2.7 Public Services

Existing Condition

The City of Bellingham's Fire Station number 2 is located at 1590 Harris Ave. The fire station houses an engine, aerial ladder unit, and medic unit that were all replaced in 2009. The Bellingham Police Department is the lead law enforcement agency in the area that is being proposed for development. The Bellingham School District is the public school authority for grades K-12 in this area. The closest elementary school is Wade King Elementary, located approximately 3 miles to the northeast of the proposed site. Kulshan Middle School is the closest middle school, located approximately 5 miles to the northeast of the proposed site. Sehome High School is the closes high school in the area, located approximately 3 miles to the northwest.

Proposed Action

Impacts

If the 245 additional homes were built the area would still be served by the Bellingham Fire Department from Station 2. Currently Station 2 covers an area of 4283 acres and serves an estimated 15,000 people. The increased housing and number of residents would cause the number of calls to increase. Since the station has a full time crew it would be able to handle the increased traffic. The Bellingham Police department would continue to be the head law enforcement agency in the area. Additional homes would put increased pressure on the county's public services to effectively provide adequate protection and assistance in the event of an emergency.

Mitigation

The increased demand on public services could be resolved in a few different ways. Either increase the amount of facilities or increase the amount of staff at existing facilities to handle the increased demand from public services. Whatcom County Ordinance 20.75 imposes school facility impact fees on new development that will have an impact on public schools. This equates to $1854 per single family home, the 245 homes would generate over $300,000 (Cowan). In addition to Bellingham Police Officers patrolling the area, neighborhood block watches could be organized to help reduce the amount of crime in the area. Education campaigns by Police and Fire officials would also help to reduce the amount of emergency responses as well as the significance of the responses.

Alternative

Impacts

The alternative action would also allow for development. With homes spread across the area, the impacts would be similar to the clustered development. The increased homes would put more pressure on the fire and police system in the area. In addition this would also put an increased amount of pressure on the local school system and require more busses to transport the children to school.

Mitigation

Mitigation for the impacts of the alternative action would be similar to those of the proposed action. Since there are similar impacts on the school, fire, and police system they can be addressed in similar ways

No Action

The no action alternative would not allow any homes to be built in the development area. This option would not have any increased pressure on public services in the area.

2.8 Utilities

Existing Condition

In the City of Bellingham Puget Sound Energy provides electricity. In Whatcom County 80% of the electrically comes from hydroelectric sources (PUD Whatcom). Cascade Natural Gas provides natural gas; in rural areas propane is used in the place of natural gas. Electrical, water, sewer and natural gas lines have not been run to the site yet. In addition communications lines for television and cable will need to be added during construction. Quest handles telephone service, and Comcast is the cable authority for Bellingham. The Sanitary Service Corporation is the only company licensed for solid waste disposal in the City Of Bellingham. They pick up trash and recycling once a week operating on a fee-based system which residents must sign up for under Whatcom County's Universal Waste Collection Ordinance.

Proposed Action

Impacts

With the addition of homes to the area extensions of the current utility lines will be required. The new clustered development would have all utility lines run before the homes are built. This would increase demand for water, sewer, power, and other utilities. Storm water run off would also increase due to the increased amount of non-porous surfaces, causing the need to increase reservoirs or filtration systems. Low Impact Development (LID) practices such as rain gardens or rain barrels can help limit the amount of runoff that makes it to the storm water system.

Mitigation

Green building and LEED certification techniques could be implemented for the new development. By using energy efficient appliances, lights, and building techniques the developers would be able to create homes that are more efficient and cost effective to live in and are also more appealing in today's housing market. Porous pavements could be used in streets and driveways to help reduce the amount of runoff and pollution transported into the storm water system. Porous or permeable pavements can absorb up to five gallons per square foot of pavement per minute (PervousPavement.org). This helps to recharge ground water aquifers and reduce surface water runoff that transports pollutants in storm water

Alternative

Impacts

The alternative action would also require the extension of utilities to any newly constructed homes. Since the homes would be constructed further apart from each other there would be an increased cost to run utilities. Other impacts such as the increased amount of sewer run off would be similar to the proposed action.

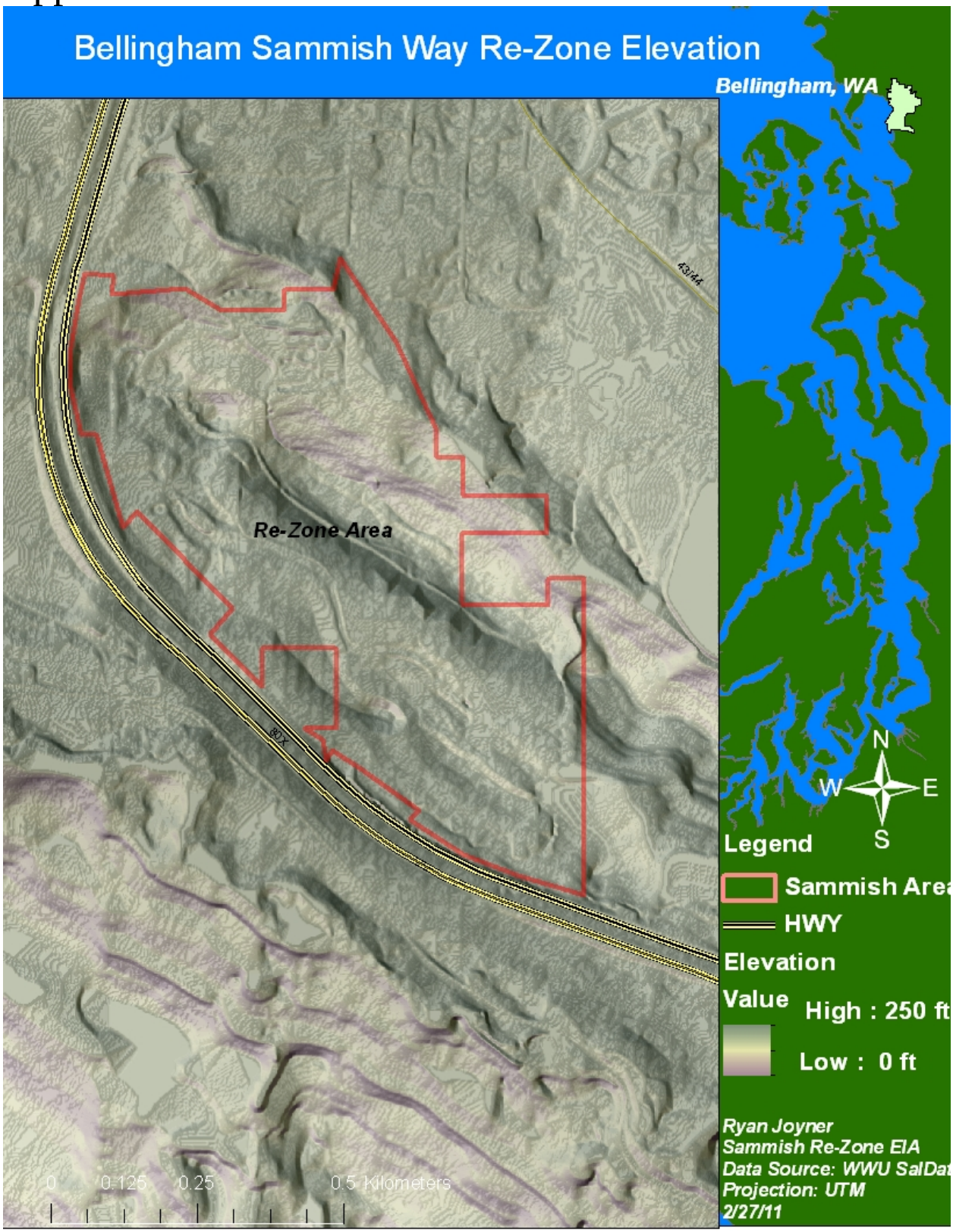
Mitigation

To mitigate some of the costs associated with the new homes not all utilities would need to be run. In more rural areas homes use propane gas instead of natural gas for heating and cooking. This would eliminate the need for natural gas pipelines to be run to all the homes. In addition septic tanks could be used instead of the main sewer system, this would require further inspection of the watershed and soils to determine if the land is suitable.

No Action

The no action alternative would not allow any homes to be constructed in the development area. This would push development onto other parts of the county since new homes are required for the increased population growth.

Appendix


Bellingham Sammish Way Re-Zone Elevation
Bellingham, WA
Re-Zone Area
N
W
E
S
Legend
Sammish Area
HWY
Elevation
Value
High : 250 ft
Low : 0 ft
Ryan Joyner
Sammish Re-Zone EIA
Data Source: WWU SalDat
Projection: UTM
2/27/11
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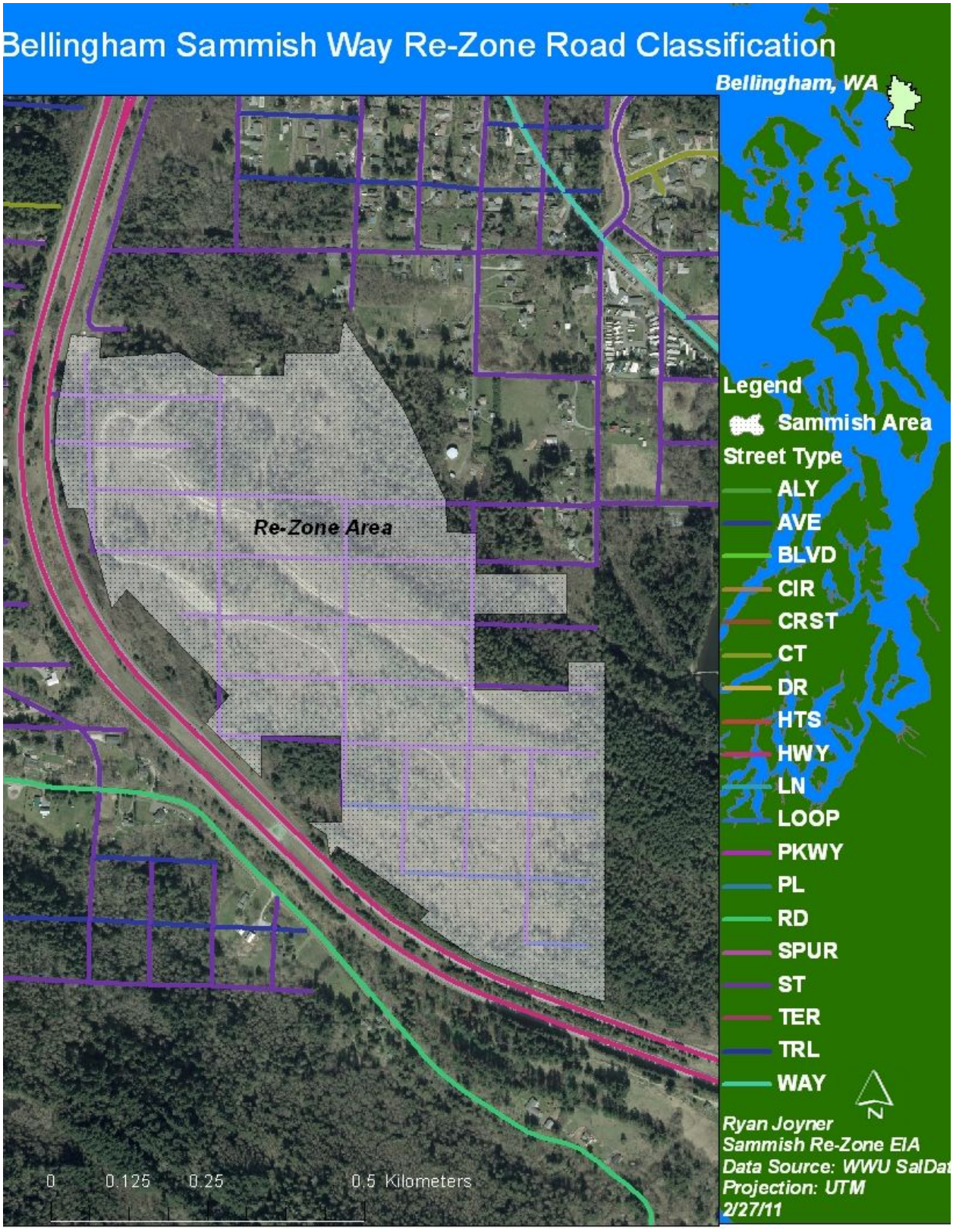
0.25
0.5 Kilometers


Bellingham Sammish Way Re-Zone Road Classification
Bellingham, WA
Re-Zone Area
Legend
Sammish Area
Street Type
ALY
AVE
BLVD
CIR
CRST
CT
DR
HTS
HWY
LN
LOOP
PKWY
PL
RD
SPUR
ST
TER
TRL
WAY
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Ryan Joyner
Sammish Re-Zone EIA
Data Source: WWU SalDat
Projection: UTM
2/27/11
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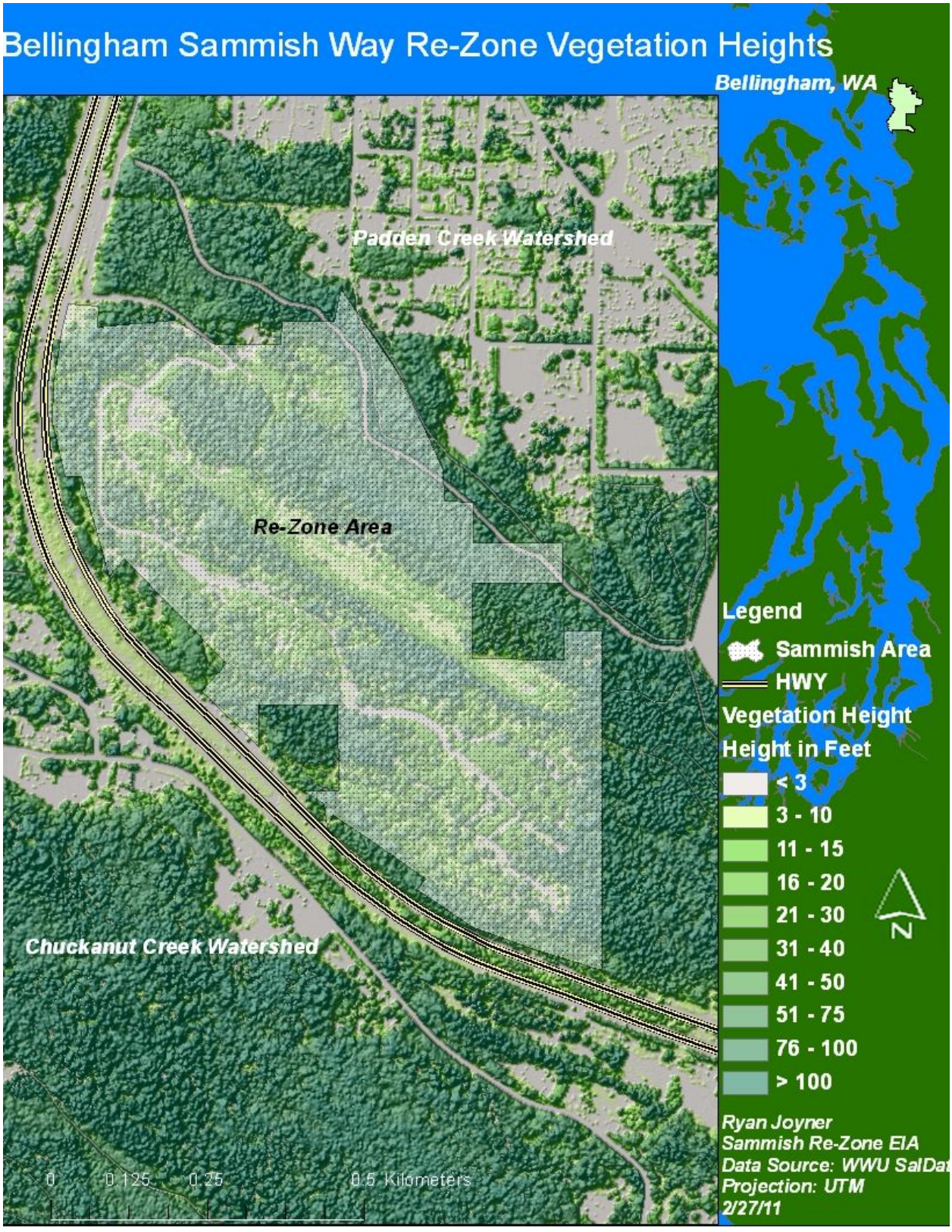
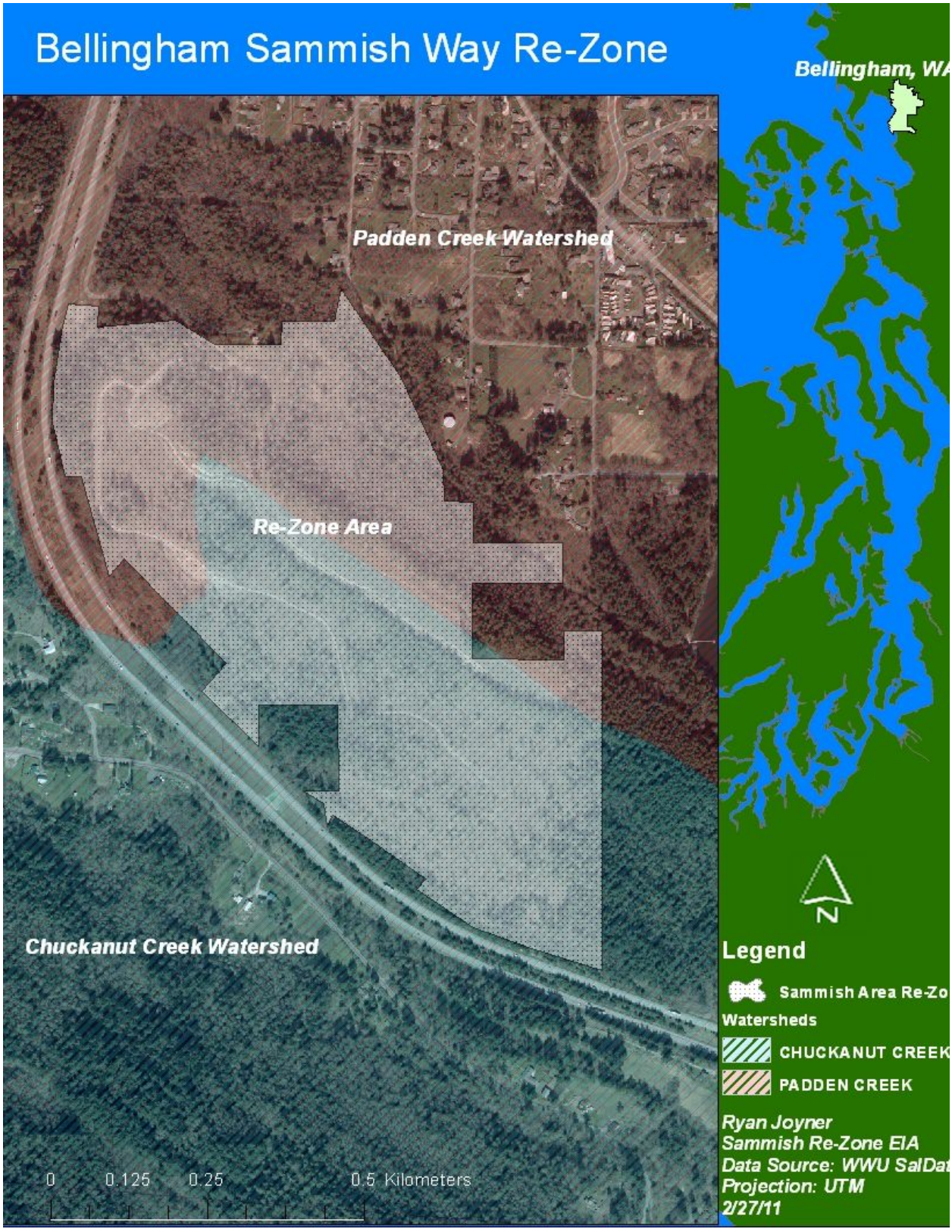

Bellingham Sammish Way Re-Zone Vegetation Heights
Bellingham, WA
Padden Creek Watershed
Re-Zone Area
Chuckanut Creek Watershed
0 0.125 0.25 0.5 Kilometers
Legend
Sammish Area
HWY
Vegetation Height
Height in Feet
< 3
3 - 10
11 - 15
16 - 20
21 - 30
31 - 40
41 - 50
51 - 75
76 - 100
> 100
N
Ryan Joyner
Sammish Re-Zone EIA
Data Source: WWU SalDat
Projection: UTM
2/27/11


Bellingham Sammish Way Re-Zone
Bellingham, WA
Padden Creek Watershed
Re-Zone Area
Chuckanut Creek Watershed
0 0.125 0.25 0.5 Kilometers
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Legend
Sammish Area Re-Zo
Watersheds
CHUCKANUT CREEK
PADDEN CREEK
Ryan Joyner
Sammish Re-Zone EIA
Data Source: WWU SalDat
Projection: UTM
2/27/11

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